

REMARKS

Claims 20-21, 23, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5 2001/0041455 A1 (Yun et al.). Claims 1-7, 13-14, 17-19, 24-25, 27, 33 and 36 are rejected under 35 U.S.C. 103(a) as being anticipated over U.S. Patent No. 2001/0041455 A1 (Yun et al.) in view of U.S. Patent No. 5,185,601 (Takeda et al.). Claims 8-12, 15-16, 28-32 and 34-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15 1. Rejection over claims 20-21, 23, and 26 under 35 U.S.C 112(e):

Claims 20-21, 23, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5 2001/0041455 A1 (Yun et al.).

20 Yun et al. disclose a process to manufacture a semiconductor device comprising the steps of forming a photoresist layer ([0027]) over a dielectric layer ([0027]), patterning the photoresist layer to form an opening extending through to the surface of the dielectric layer ([0027]), performing a dry etching process to remove parts of the dielectric layer to form a contact hole extending to the surface of the conductive layer ([0030]) and performing a post treatment process to form a protective layer and 25 stripping the photoresist. ([0030] and [0029]) The process further comprises removing the protective layer after stripping the photoresist. (Fig. 8) A 30

contact plug is formed in the via hole. ([0027])

Response:

Claim 20 is amended by particularly pointing out
5 the feature of the present invention. Claim 35 is
merged into the amended claim 20 and thereby canceled.
The newly added portion in the amended claim 20 is
disclosed in the paragraphs [0016]-[0017] and Fig.5
of the present application. No new matter is
10 introduced.

To show the major differences/non-obviousness, the
amended claim 20 is repeated below:

15. "20. (Currently amended) A method for improving contact hole patterning in a semiconductor wafer, the semiconductor wafer comprising a substrate, a conductive layer positioned on the substrate surface, and a dielectric layer disposed on the conductive layer,
20 the method comprising the following steps:
forming a photoresist layer on the dielectric layer, the photoresist layer having an opening extending through to the surface of the dielectric layer;
performing an etching process to remove parts of
25 the dielectric layer along the opening to form a contact hole extending to the surface of the conductive layer;
performing a post treatment process to form a protective layer under the contact hole covering the
30 surface of the conductive layer; and
stripping the photoresist layer with a base solution."

In the present invention, a post treatment process is performed to form a protective layer under the contact hole covering the surface of the conductive layer. Thus, the surface of the conductive layer under the contact hole can be protected from being damaged while the photoresist layer is stripped by a base solution. It improves the contact hole patterning sufficiently and increases the reliability of products and the stability of data transmission through the contact plug or conductive trace inside the contact hole.

Regarding Yun's invention, all of the disclosure focuses on the problems occurred after forming the contact plug. The fabricating processes before forming a contact plug or a conductive trace inside the contact hole are not disclosed. Thus, it is an obvious difference that Yun's disclosure does not provide any suggestion or solution to solve those problems caused by the base photoresist stripper before the contact plug is formed but the method of the present invention does.

From the aforementioned reasons, the Applicant believes that the amended claim 20 of the present application shows difference/non-obviousness since there is a major difference between the present application and the prior art references. Reconsideration of the amended claim 20 is politely requested.

Claims 21, 23, and 26 are dependent on the amended claim 20 and should be allowed if the amended claim 20 is allowed. Reconsideration of claims 21, 23, and 26 is hereby requested.

5

2. Rejection over claims 1-7, 13-14, 17-19, 24-25, 27, 33 and 36 are rejected under 35 U.S.C. 103(a):

Claims 1-7, 13-14, 17-19, 24-25, 27, 33 and 36 are rejected under 35 U.S.C. 103(a) as being anticipated over U.S. Patent No. 2001/0041455 A1 (Yun et al.) in view of U.S. Patent No. 5,185,601 (Takeda et al.) substantially as set forth in Paper No. 3 to 4, paragraph 4.

15 Response:

Claims 1 and 20 are amended by particularly pointing out the feature of the present invention. Claim 16 is merged into the amended claim 1 and thereby canceled. Claim 35 is merged into the amended claim 20 and thereby canceled. The newly added portions in the amended claims 1 and 20 are disclosed in the paragraphs [0016]-[0017] and Fig.5 of the present application. No new matter is introduced.

25 To show the major differences/non-obviousness, the amended claim 1 is repeated below:

"1. (Currently amended) A method for improving contact hole patterning in a liquid crystal display (LCD) panel, the liquid crystal display panel comprising a substrate, a conductive layer positioned on the substrate surface, and a dielectric layer disposed on

the conductive layer, the method comprising the following steps:

5 forming a photoresist layer on the dielectric layer, the photoresist layer having an opening extending through to the surface of the dielectric layer;

performing an etching process to remove parts of the dielectric layer along the opening to form a contact hole extending to the surface of the conductive layer;

10 performing a post treatment process to form a protective layer under the contact hole covering the surface of the conductive layer; and

stripping the photoresist layer with a base solution."

15

As mentioned above, the present invention disclosed a method comprising a post-treatment process before a contact plug or a conductive trace is formed inside the contact hole. The post-treatment process forms a protective layer under the contact hole to protect the conductive layer from being damaged by a base solution which is used in a followed photoresist stripped process.

25

In contrast with the Yun's invention, all the disclosure focuses on a situation after forming the contact plug. The problems before the contact plug formed are never mentioned in Yun's invention. Thus, it is obvious that no suggestion about the problems caused by the base photoresist layer stripper is provided. Regarding the Takeda's invention, a basic structure of an LCD is disclosed. However, the

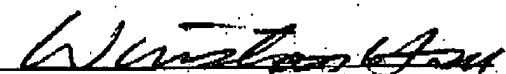
aforementioned problems and suggestion thereof are not disclosed in the Takeda's disclosure.

Regarding Yun's invention, which is focused on the problems occurred after the contact plug is formed, the fabricating processes before forming a contact plug or a conductive trace inside the contact hole are not disclosed. Thus, it is an obvious difference that Yun et al. do not provide any suggestion or solution to solve those problems occurred before the contact plug is formed while the method of the present invention does.

From the aforementioned reasons, the Applicant believes that the amended claims 1 and 20 of the present application show difference/non-obviousness since there is a major difference between the present application and the prior art references. Reconsideration of the amended claims 1 and 20 is politely requested.

Claims 2-7, 13-14, 17-19, 22, 24-25, 27, 33 and 36 are dependent on the amended claims 1 and 20 and should be allowed if the amended claims 1 and 20 are allowed. Reconsideration of claims 2-7, 13-14, 17-19, 22, 24-25, 27, 33 and 36 is hereby requested.

Sincerely,



Date: 1/14/2004

5 Winston Hsu, Patent Agent No. 41,526
P.O. BOX 506
Merrifield, VA 22116
U.S.A.
e-mail : winstonhsu@naipo.com.tw

10 (Please contact me by e-mail if you need a telephone communication and I will return your call promptly.)